

THE SPECIES OF *FUMARIA* (PAPAVERACEAE) IN TEXAS, INCLUDING
F. DENSIFLORA, FIRST RECORDS FROM NORTH AMERICA

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ABSTRACT

Examination of specimens of *Fumaria* from Texas reveals that *Fumaria officinalis*, *F. parviflora*, and *F. densiflora* have been collected in the state; the latter has not previously been recorded from North America. Notes on distinguishing the species known from Texas are provided, along with a list of representative specimens. Herbarium material from the rest of North America should be re-examined for the presence of species not currently listed for the region.

RESUMEN

El examen de especímenes de *Fumaria* de Texas revela que se han recogido en el estado *Fumaria officinalis*, *F. parviflora*, y *F. densiflora*; esta última no había sido citada en Norte América. Se aportan comentarios sobre cómo distinguir las especies conocidas en Texas, junto con una lista de especímenes representativos. Debería reexaminarse el material de herbario del resto de Norte América para ver la presencia de especies que no están actualmente listadas en la región.

The genus *Fumaria* (formerly placed in the Papaveraceae) comprises some fifty species (Lidén 1986) of annual herbs native to Europe, Africa, and Asia, though many species are now naturalized elsewhere in the temperate zone. The plants are similar in aspect to the more familiar *Corydalis*, having spreading to ascending stems, finely divided leaves, and racemes of strongly zygomorphic, spurred flowers. *Fumaria* differs in having a caducous style (Lidén 1986); white to pink or purplish flowers, often with darker petal tips; and single-seeded fruits.

Fumaria has been known in Texas since at least 1927 [*F. officinalis* L. subsp. *officinalis*. Texas. Goliad Co: Roadside, Mar 1927, Williams 73 (TEX).] Correll and Johnston (1970) listed both *F. officinalis* and *F. parviflora* Lam for the state, as did Jones, et al. (1997). Boufford (1997) listed *F. officinalis*, *F. capreolata* L., and *F. vaillantii* Loisel. for North America and only *F. officinalis* for Texas. He did not include *F. parviflora* for North America, stating that it occurs in North America only as a waif. Since then, most Texas collections have been “pigeonholed” into *F. officinalis*. Billie L. Turner annotated many sheets as *F. officinalis* in 2000, and Turner et al. (2003) mapped only *F. officinalis* for the state.

In 2007, Richard Lansdown examined TAMU holdings of *Fumaria* and detected *F. densiflora* among them. [Texas. Medina Co: Hondo; Weedy vacant strip at jct. Ave H and 18th Street, 16 Mar 2004, Reed, Walters, & Corbett 2746 (TAMU)].

We subsequently borrowed specimens of *Fumaria* from Texas from BRIT/SMU, TAES, TEX/LL, and SBSC. Careful examination, with reference to the works of Lidén (1986) and Sell (1993) and to European herbarium specimens, confirmed the presence of multiple collections of *F. officinalis*, *F. parviflora*, and *F. densiflora* from Texas. In one case, two species were collected from the same location within two weeks of one another.

Additionally, all three species are represented by material collected since 1990. Some populations may be persisting, but it is probable that additional introductions continue to occur.

Identifying specimens of *Fumaria* can be problematic, especially with dry material. Characters traditionally used to separate species are not always reliable (Lidén 1986). Flower color is not definitive, since white flowers may turn pink after pollination; the flowers increase in size during development; and bract vs. pedicel length is variable. The relative sepal length and width, length of fully mature flowers, and fruit characteristics are the most reliable when separating the species known from Texas.

The following key will separate the species known from Texas.

1. Sepals broader than the corolla _____ **F. densiflora**
1. Sepals usually narrower than the corolla (occasionally nearly as broad).
 - 2.. Fruit broader than long, often truncate or even depressed apically (may be apiculate in subsp. *wirtgenii*, but not keeled or ridged); flowers pink, 7–9 mm long _____ **F. officinalis**
 2. Fruit narrower than long, somewhat keeled apically, often appearing apiculate if viewed from the side; flowers white at anthesis, (4.5–)5–6 mm long _____ **F. parviflora**

A more confident identification of the three species known from Texas can be made by comparing suites of characters (largely from Lidén 1986) as given below. Note that in all species the corollas may be darker (pink to purple or black) at the tips.

Fumaria densiflora DC. Bracts usually longer than the fruiting pedicels; fruiting pedicels strongly thickened; sepals 2–3(–3.5) mm long, 1.5–3 mm broad, usually orbicular to ovate, wider than the corolla, giving unexpanded racemes a papery aspect; corolla 6–7 mm long, pink; fruit apically rounded to obtuse, slightly keeled, rugulose, 2–2.3 mm long and broad (Fig. 1). Images of the Medina Co. plants may be viewed at http://www.csd1.tamu.edu/FLORA/cgi/gallery_query?q=fumaria

Fumaria officinalis L. Bracts $\frac{1}{2}$ as long as to as long as the pedicels; sepals usually narrower than the corolla; corolla (6.6–)7–9 mm long, pink when well-developed; fruit broader than long, rugulose, the apical pits shallow and rounded: subsp. **officinalis**. Sepals (1.6–)2.5–3.5 mm long, 1.5(–1.7) mm broad; fruit 2(–2.4) mm long, (2.25–)2.5 mm wide, apically truncate and appearing depressed or emarginate when viewed from the side: subsp. **wirtgenii** (Koch) Sell. Sepals smaller, 1.5–2 mm long, 0.75–1 mm long; corolla 7–8 mm long, paler than in subsp. *officinalis*; fruit rounded, more strongly rugose, apically essentially subtruncate, rounded and minutely apiculate when viewed from the side, but not keeled, ridged, or emarginate (Fig. 2).

Fumaria parviflora Lam. Bracts usually relatively broad and longer than the pedicels; fruiting pedicels often strongly thickened; sepals 0.5–0.75(–1.8) mm long, 0.4–0.75(–1.6) mm wide, not broader than the corolla; corolla (3.9–)5–6 mm long, white before pollination and often fading pink afterwards; fruit 1.6–2.3 mm long, 1.6–2.5 mm wide, usually longer than wide, apically subglobose to nearly acute, keeled, pointed as seen from the side, the apical pits broad and squarish (Fig. 3).

A FINAL NOTE

It *must* be emphasized that all Texas—and indeed all North American collections!—of *Fumaria* represent naturalized, recently introduced, single-event/impermanent, waif, or otherwise non-native populations. Thus, any new collection of *Fumaria* ought to be identified using keys which include **all** *Fumaria* species. That is to say, a key to European, Asian, and African species ought to be used in addition to a key designed for a particular region. For example, in addition to the species listed here or present in the key in Boufford (1997), *F. bastardii* Bor. and *F. reuteri* Boiss. (= *F. martinii* Clay) have also been recorded in North America (Boufford 1997.) It is entirely possible that additional species will be found in Texas in the future. It is also likely that a thorough re-examination of all North American herbarium specimens would reveal the presence of more taxa than the three listed by Boufford (1997).

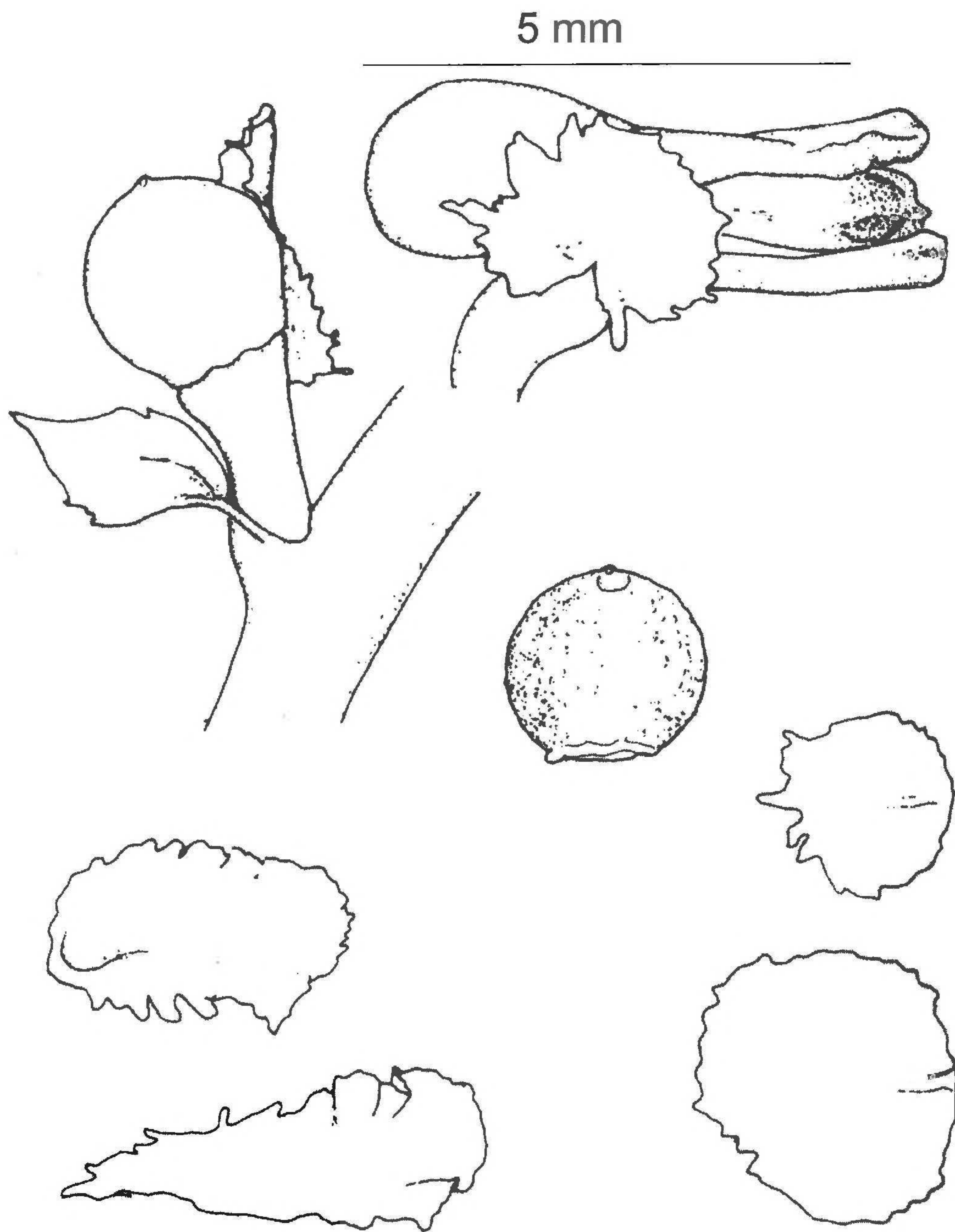


FIG. 1. Flower, fruit, and sepals of *Fumaria densiflora*. Reproduced from Lidén (1986) with permission.

ADDITIONAL REPRESENTATIVE SPECIMENS FROM TEXAS

***Fumaria densiflora* DC.**

Bexar Co.: San Antonio, N side Loop 410 between Espada Rd and Roosevelt Rd (U.S. 281), 1 Apr 1969, *MacEwan s.n.* (SMU). **Dimmitt Co.:** Crystal City, Mar 1931, *Parks s.n.* (TAES); 2½ mi S of Crystal, 1 Apr 1973, *Sturm s.n.* (SMU). **Montgomery Co.:** Kingwood, Kingwood Drive, 15 May 1987, *Opperman s.n.*, (SBSC). **Travis Co.:** Austin, near Texas Memorial Museum, 26 Mar 1956, *McCart 5526* (SMU); Austin, Colorado River Bottom at Montopolis Bridge, 19 Apr 1957, *McCart 6555* (SMU); campus of the University of Texas, Austin, 8 Mar 1955, *Anderson s.n.* (TEX). **Wharton Co.:** 0–0.5 mi E of Kriegel Rd, N of Caney Creek, S of Hwy 1301, 15 Feb 1990, *Hanka 2* (TAMU); Boling, Luper Ranch, 6 Feb 1971, *Fleetwood s.n.* (TEX).

***Fumaria officinalis* L.**

Note.—We attempted to name the better material to subspecies following Lidén (1986). Lidén (1986) and Sell (1993) define the subspecies in different ways, and the characters they use do not always correlate well, so the determinations are provisional. Boufford (1997) noted the occurrence in North America of plants conforming to subsp. *wirtgenii* but did not recognize infraspecific taxa in his account. The specimen cited

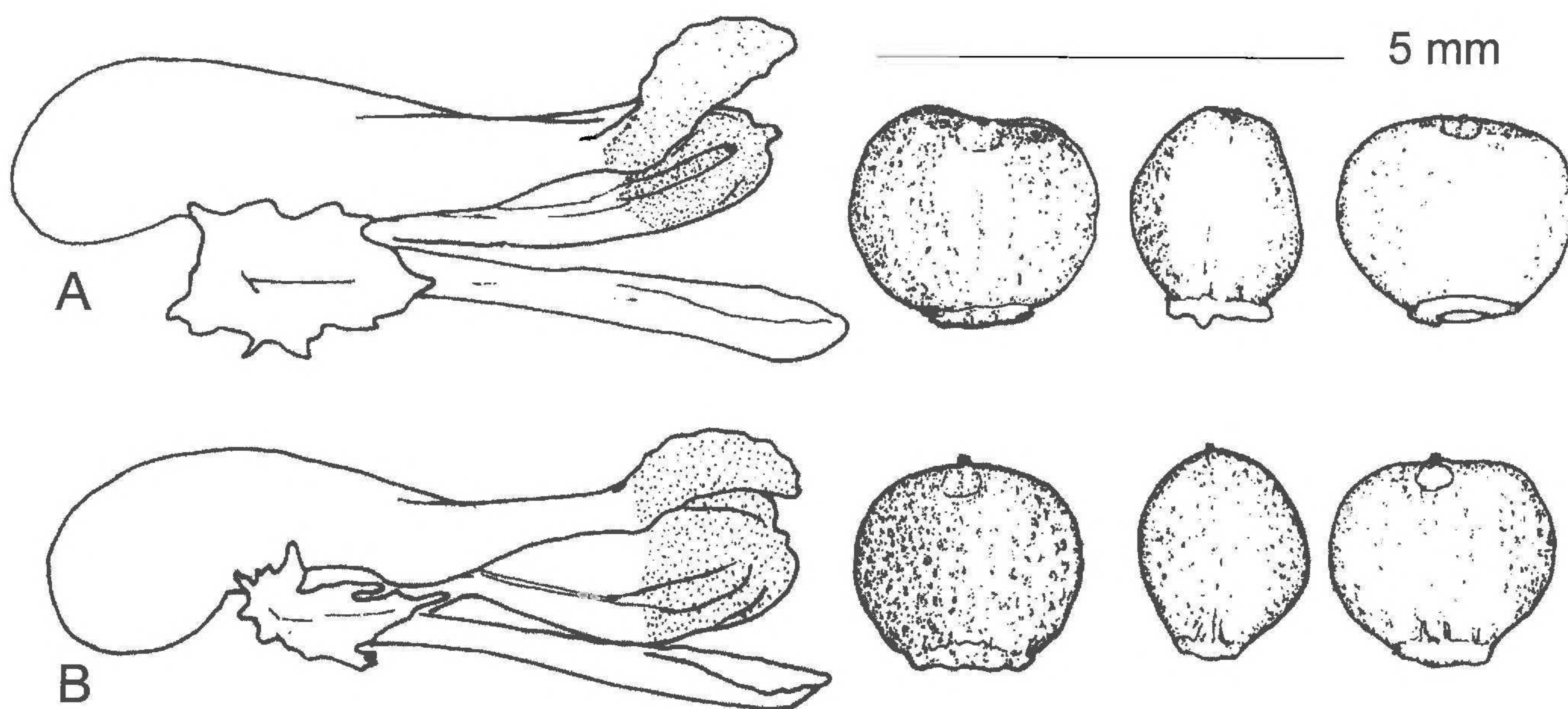


FIG. 2. Flowers and fruit of *Fumaria officinalis*. A. subsp. *officinalis*. B. subsp. *wirtgenii*. Reproduced from Lidén (1986) with permission.

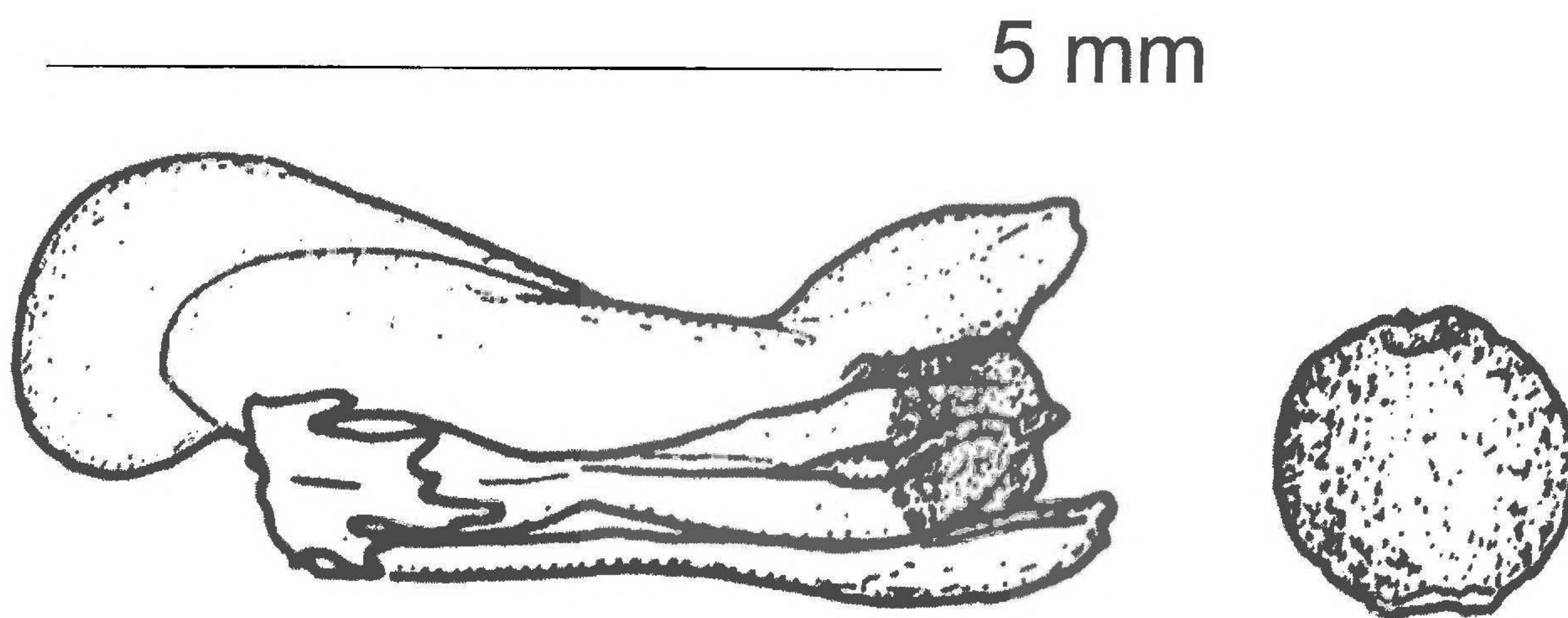


FIG. 3. Flower and fruit of *Fumaria parviflora*. Reproduced from Lidén (1986) with permission.

near the beginning of this paper belongs to subsp. *officinalis*. The two below were undeterminable as to subspecies.

Gillespie Co.: Fredericksburg, 18 May 2003, *Lindeman s.n.* (BRIT). **Smith Co.:** Old Experimental Station 1 mile N by E of Troup (abandoned 1931), 9 Apr 1949, *Cory 55568* (SMU).

***Fumaria parviflora* Lam.**

Bexar Co.: San Antonio, N side Loop 410 between Espada Rd and Roosevelt Rd (U.S. 281), 13 Apr 1969, *MacEwan s.n.* (SMU). **Dimmitt Co.:** Carrizo Springs, 29 May 1948, *Hudspeth 216* (BRIT). **Hidalgo Co.:** McAllen, railroad tracks between Weyheuser and Texas Motor Trailer Court, 3 Apr 1965, *Fleetwood 8067* (TEX); McAllen; N McColl Rd between Violet and Nolana Streets; 26 Feb 1992, *Halse 4440* (BRIT, TAES); Weslaco, 18 Feb 1939, *Friend 27851* (TAES); Weslaco, 18 Feb 1942, *Friend 1949* (SMU); Weslaco, 18 Feb 1942, *Friend 1950* (TEX). **Travis Co.:** NW corner of SE lagoon at Hornsby Bend Sewage Treatment Plant, ca. 1.5 air mi N 32° W of jct. of FM. 973 and TX. Rt. 71, 19 Apr 1983, *Carr 7283* (BRIT). **Williamson Co.:** Anderson Mill, future home sites at SW corner of Lake Creek Parkway and RM 620, 18 May 1982, *Carr 3969* (BRIT).

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